Assignment 3

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CBSE Probability Grade 9

Example 10: Fifty seeds were selected at random from each of 5 bags of seeds, and were kept under standardised conditions favourable to germination. After 20 days, the number of seeds which had germinated in each collection were counted and recorded as follows:

Bag	1	2	3	4	5
Number of seeds germinated	40	48	42	39	41

TABLE I

What is the probability of germination of
(i) more than 40 seeds in a bag ?
(ii) 49 seeds in a bag ?
(iii) more than 35 seeds in a bag ?

Solution. Let a random variable $X \in [0, 50]$ where $X \in \mathbb{Z}$, denote the number of seeds germinated in a bag. Also, let $n(X = k)$ denote the number of bags in which number of seeds germinated $= k$.

(i) The probability of germination of more than 40 seeds in a bag:

$$\Pr(X > 40) = \frac{n(X > 40)}{n(X > 40) + n(X \leq 40)} \tag{1}$$

$$= \frac{3}{3+2} \tag{2}$$

$$= \frac{3}{5} \tag{3}$$

$$= 0.6 \tag{4}$$

$\therefore$ The probability of germination of more than 40 seeds in a bag is 0.6

(ii) The probability of germination of 49 seeds in a bag:

$$\Pr(X = 40) = \frac{n(X = 49)}{n(X = 49) + n(X \neq 49)} \tag{5}$$

$$= \frac{0}{0+5} \tag{6}$$

$$= \frac{0}{5} \tag{7}$$

$$= 0 \tag{8}$$

$\therefore$ The probability of germination of 49 seeds in a bag is 0.0

(iii) The probability of germination of more than 35 seeds in a bag:

$$\Pr(X > 40) = \frac{n(X > 35)}{n(X > 35) + n(X \leq 35)} \tag{9}$$

$$= \frac{5}{5+0} \tag{10}$$

$$= \frac{5}{5} \tag{11}$$

$$= 1.0 \tag{12}$$

$\therefore$ The probability of germination of more than 35 seeds in a bag is 1.0